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(71)Applicant : FURUNO ELECTRIC CO LTD

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(72)Inventor : SASAKURA TOYOKI

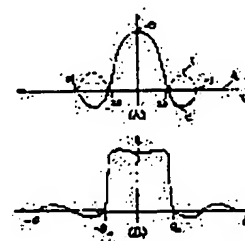
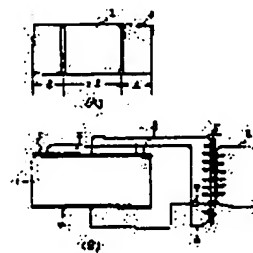
ENDO YASUHIKO

## (54) SOUND WAVE TRANSMITTER-RECEIVER

(57)Abstract:

PURPOSE: To emit detection signals by a simple constitution of a device so that a signal strength in a range of specified directional angles can be held at a constant extent and allow the device to receive signals coming from its range of the above directional angles at a constant sensitivity by exciting a wave transmitting surface with specific signals and also fetching the specific signals from a wave receiving surface to synthesize them.

CONSTITUTION: The wave transmitting surface of the echo sounder transducer/receiver having wave transmitting and receiving surfaces as long as  $2nl$  is excited by the specific signals having amplitudes at curve points of a  $\sin A/A$  corresponding to the wave transmitting surface and forms a wave transmitting beam in the range of the directional angles  $\pm\theta_0$  and furthermore the echo sounder transducer/receiver is composed so that a wave receiving beam is formed in the range of the directional angles  $\pm\theta_0$  by fetching the signals having the amplitudes at the curve points of the  $\sin A/A$



corresponding to the wave receiving surface from the wave receiving surface of the echo sounder receiver and also by synthesizing them, provided that  $A=2\pi \times \theta_0$ ,  $\vec{x} = n\lambda$ . For example, on electrode contacting an upper side of a rectangle piezoelectric vibrator 1, is divided into three portions so that a length of a main electrode 2 is  $2l$  and the length of a sub-electrode 3 is  $l$ . A sheet of the rectangle electrode 4 is brought into contact closely a lower side of the piezoelectric vibrator 1. And the specific signals having an amplitude (b) are supplied the main electrode 2, while the signals having the amplitude (c) are supplied the sub-electrode 3 to obtain directional characteristics as shown in Fig. B.

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## LEGAL STATUS

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